



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 4

61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

SITE: PIONEER SAND  
BREAK: 8.6  
OTHER: Vol. 2

November 16, 2004

4WD - SRTSB

10141302

Subj: Finalization of Second Five Year Review  
Pioneer Sand Company  
EPA I.D. Number: FLD 056 116 965



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Section 121(C) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, requires that if a remedial action is taken that results in any hazardous substances, pollutants, or contaminants remaining at the site, then the Environmental Protection Agency (EPA) shall review the remedial action no less than every five years after initiation of the remedial action to assure that human health and the environment are being protected by the implemented remedial action. Accordingly, the first Five Year Review Report for the Pioneer Sand Superfund Site was finalized on December 22, 1999.

To meet the requirement for performing and completing the Second Five Year Review by December 22, 2004, EPA contracted with the US Army Corps of Engineers (Mobile District) for preparation of the Second Five Year Review Report. EPA reviewed, edited and finalized the draft report provided by the Corp. A copy of this finalized report is attached to this memo for your review (Attachment 1).

The following is a brief summary of the major actions taken at the Site

Event	Date
Site Listed on National Priorities List	September 8, 1983
Remedial Investigation	June 1985
Feasibility Study	June 1986
Removal Action of PCBs	August 6, 1996
Record of Decision	September 26, 1986
Consent Decree Filed	July 8, 1988
Remedial Action Plan	June 1990
Remedial Action Initiated	March 3, 1990
Operation and Maintenance Plan	August 1990
Remedial Action Completed	March 28, 1991
Site Closeout Report	December 1991
Site Removed from the National Priorities List	February 8, 1993
First Five-Year Review Completed	December 22, 1999

The remedy at the Pioneer Sand Superfund Site remains protective. The cap appears to be effective in containing contaminants, preventing infiltration of rainwater and preventing direct contact with contaminated soils. Institutional controls remain in place and effective.

If your review finds the attached report acceptable, please sign and date the title page, and return the entire report to me for distribution.

If you have any questions, please contact me at 2-8938.

Attachment: 1. Second Five Year Review Report (November 2004)

**FINAL  
SECOND FIVE-YEAR REVIEW REPORT  
FOR  
PIONEER SAND COMPANY  
PENSACOLA,  
ESCAMBIA COUNTY, FLORIDA  
EPA ID: FLD 056 116 965**

November 2004

Draft Prepared By:

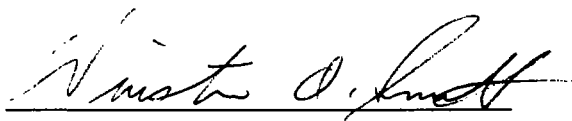
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Draft Reviewed, Edited and Finalized By:

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Date:



Winston A. Smith  
Director  
Waste Management Division  
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12-13-04

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## LIST OF ACRONYMS, SYMBOLS, AND ABBREVIATIONS

AOC	Administrative Order on Consent
ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CSES	Sites Environmental Services
COPC	Contaminant of Potential Concern
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NA	not applicable
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PAHs	polycyclic aromatic hydrocarbons
PCB	polychlorinated byphenyl
PRP	potentially responsible parties
PSC	Pioneer Sand Company
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
Site	Pioneer Sand Company
SI	Site Investigation
µg/L	micrograms per liter
USACE	US Army Corps of Engineers

## **EXECUTIVE SUMMARY**

The remedial action for the Pioneer Sand Company site in Pensacola, Florida addressed soil, sludge material and groundwater as Operable Unit 1 (OU-1). The removal action and remedy at the site consisted of removal of about 20 tons of soils contaminated with PCBs, stabilization of sludge materials under a cap, construction of a leachate collection system, construction of a methane gas collection and venting system and long term groundwater monitoring program. In December 1999, the Site Closeout Report was issued to document completion of all construction activities associated with the Pioneer Sand Company site. Groundwater monitoring was initiated in October 1991 and has continued semi-annually through the April 2004 sampling event. The trigger for this five-year review was the initial five-year review completed in December 1999.

The cap appears to be effective at containing contaminants by preventing infiltration of rainwater and preventing direct contact with the contaminated soils. However, there is analytical evidence that suggest changes in the water table, due to seasonal fluctuations and rising surface waters in the large pond on the site, are promoting intermittent leaching of some low levels of contaminants (above the maximum contaminant level (MCL)) into the groundwater.

Despite conceptual issues raised in this five year review on performance of the remedy, which are in contrast to how performance was viewed in the original ROD, the remedy continues to be protective of human health and the environment.

## FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
<b>Site name (from WasteLAN):</b> Pioneer Sand Company		
<b>EPA ID (from WasteLAN):</b> FLD 056 116 965		
<b>Region:</b> 4	<b>State:</b> FL	<b>City/County:</b> Pensacola/Escambia
SITE STATUS		
<b>NPL status:</b> <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
<b>Remediation status</b> (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
<b>Multiple OUs?*</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		<b>Construction completion date:</b> 07/19/1991
<b>Has site been put into reuse?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
<b>Lead agency:</b> <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
<b>Author name:</b> Juan Payne		
<b>Author title:</b> Geologist		<b>Author affiliation:</b> U.S. Army Corps of Engineers
<b>Review period:*</b> 1/12/04 to 12/22/04		
<b>Date(s) of site inspection:</b> 05/20/2004		
<b>Type of review:</b> ROD was signed September 26, 1986. SARA was effective October 17, 1986. <div style="text-align: center; margin-top: 10px;"> <input checked="" type="checkbox"/> Post-SARA   <input checked="" type="checkbox"/> Pre-SARA   <input type="checkbox"/> NPL-Removal only  <input type="checkbox"/> Non-NPL Remedial Action-site   <input type="checkbox"/> NPL State/Tribe-lead  <input type="checkbox"/> Regional Discretion                 </div>		
NOTE: The Five Year Review is an EPA Policy Review.		
<b>Review number:</b> <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
<b>Triggering action:</b> <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Actual Remedial Action On-site Construction  <input type="checkbox"/> Construction Completion  <input type="checkbox"/> Other (specify)                         </div> <div> <input type="checkbox"/> Actual Remedial Action Start at OU# <u>NA</u>  <input checked="" type="checkbox"/> Previous Five-Year Review Report                         </div> </div>		
<b>Triggering action date (from WasteLAN):</b> 12/22/1999		
<b>Due date (five years after triggering action date):</b> 12/22/2004		

\* [The review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

### **Five-Year Review Summary Form, cont'd.**

**Issues:**

See Section VIII, Issues.

**Recommendations and Follow-up Actions:**

See Section IX, Recommendation and Follow-up Actions.

**Protectiveness Statement:**

The cap appears to be effective at containing contaminants by preventing infiltration of rainwater and by preventing direct contact with contaminated soils/waste material. However, there is analytical evidence that suggest changes in the water table, due to seasonal fluctuations and surface waters collecting in the large pond on-site, may be contributing to intermittent leaching of low levels of contaminants (above the MCL) into the groundwater.

Despite conceptual issues raised in this five year review on performance of the remedy, which are in contrast to how performance was viewed in the original ROD, the remedy continues to be protective of human health and the environment.

The groundwater monitoring program should continue.

**Comments:**

Comments on the five year review report were provided by the State and the responsible party's management consultant. See Attachments 5 and 6.

## **SECOND FIVE-YEAR REVIEW DRAFT REPORT PIONEER SAND COMPANY PENSACOLA, FLORIDA**

### **I. INTRODUCTION**

The U.S. Army Corps of Engineers (USACE) was tasked by the U.S. Environmental Protection Agency (EPA) to conduct a five-year review of the remedial action implemented at the Pioneer Sand Company site in Pensacola, Florida, to evaluate the protectiveness of the site remedy. The five-year review was conducted from May 2004 to August 2004, and this report documents the results of the review.

The primary purpose of this five-year review is to determine whether the site remedy remains protective of human health and the environment. In addition to presenting the findings and conclusions of the review, deficiencies have been identified, and corrective actions are recommended. The five-year review documents the evaluation of the site remedy, operation and maintenance (O&M) activities, and the continued appropriateness of remedial action objectives (RAOs), and associated action levels, at the site.

This five-year review is prepared pursuant to the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA § 121 states the following:

*“If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.”*

This requirement is interpreted further in the NCP; 40 CFR § 300.430(f)(4)(ii) states the following:

*“If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action”.*

The ROD for the only operable unit (OU) at the site was signed on September 16, 1986. In 1988, a Consent Decree in the matter of United States vs. Reichhold Chemical, Inc. was entered into whereby the agreement allowed for the Remedial Design/Remedial Action to be performed by

the Settling Defendants with oversight by EPA and FDEP. The U.S. Navy is funding 50% of the remedy.

With the completion of all construction activities for the site, the Site Closeout Report was issued in December 1991. Five-year reviews are required when contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure. Contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

This is the second five-year review for the Pioneer Sand Company site. Hence, the trigger for this policy five year review was the first five-year review completed in December 1999.

## II. SITE CHRONOLOGY

The site chronology has been summarized based on the EPA Administrative Record and documents listed in Attachment 1. Table 1 presents the chronology of the major events for the Pioneer Sand Company Site.

**Table 1**  
**Chronology of Site Events**

<b>Event</b>	<b>Date</b>
Site Listed on National Priorities List	September 8, 1983
Remedial Investigation	June 1985
Feasibility Study	June 1986
Removal Action of PCBs	August 6, 1996
Record of Decision	September 26, 1986
Consent Decree Filed	July 8, 1988
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Operation and Maintenance Plan	August 1990
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Site Closeout Report	December 1991
Site Removed from the National Priorities List	February 8, 1993
First Five-Year Review Completed	December 22, 1999

### **III. BACKGROUND**

The following subsections present background information for the Pioneer Sand site including physical characteristics, land resource use, history of contamination, initial response, and basis for taking action.

#### **Physical Characteristics**

The Pioneer site is located in Pensacola, Florida, and covers approximately 11 acres. The site is accessed along a private driveway off Sauflay Field Road. The site is bounded on all sides by private property.

The site is surrounded by a system of chain-link fences. There is a fence that surrounds the capped landfill and runs along the west and a significant portion of the northern side of the site (i.e., the "inner perimeter fence"). The inner perimeter fence is gated and locked and warning signs are posted. There is also a fence that runs along the south, east and some of the northern side of the site (i.e., the "outer perimeter fence"). A multimedia cover system occupies the northwestern portion of the site and covers an area of about 4 acres. Grass or grass-like groundcover covers the cap area. Surface water drainage is currently contained on-site. The cap was designed to prevent rainfall from contacting the stabilized soil.

#### **Hydrogeologic Conditions**

The site is underlain by a water table aquifer, which ranges from 20 to 50 feet in depth, and a deeper sand aquifer from 80 to 250 feet in depth. In the shallow sand-and-gravel aquifer, the groundwater flows to the south at about one to two feet per day. The groundwater in the deeper aquifer flows toward the west at less than one-foot per day. A uniform semi-confining clay layer that is about 30 feet thick is found between these two aquifers. Water levels recorded at the site in the shallow aquifer show that the groundwater fluctuates up to 10 feet and is hydraulically connected at the surface with a large pond located at the Site.

#### **Land and Resource Use**

The land surrounding the Pioneer site within a one-mile radius consists of commercial, municipal and residential zoned areas.

#### **History of Contamination**

From the mid-1950's until 1978, the Pioneer Sand Pit was used as a borrow area for supplying sand to construct roads, buildings, etc. A Class III disposal permit, granted in 1974, allowed for the disposal of inert materials including construction debris and shredded automobile shavings. Reportedly, during this period various types of phenols and resin compounds from Newport Industries (currently Reichhold Chemical Company) were deposited. Domestic and industrial wastes, including metal plating sludge, were also received from Pensacola Naval Air Station.

In 1981, the Florida Department of Environmental Regulation did not renew the disposal permit and ordered the dumping of waste at the site to cease. By the time of the non-renewal of the disposal permit, fill material approximately one-fourth of the eleven acre pit had been backfilled to the original land surface.

In late 1981, a preliminary contamination survey was conducted to evaluate the extent of the contamination at the site. Although there were elevated levels of various metals and organics found at the site, the groundwater sampling of 15 private wells in the area revealed no appreciable contamination when compared to the background water quality in the area.

### **Initial Response**

The Remedial Investigation (RI) was conducted in late 1984 and 1985 to assess the types of contamination present at the site, the lateral and vertical extent of contamination, the rate of movement of the contaminants, contaminant pathways away from the source (fill material), and the potential impact upon the residents.

Findings during the Remedial Investigations (RI) prompted the EPA to conduct an immediate removal of PCB contaminated "hotspots" at the site on August 6, 1986. All identified areas of PCB concentrations greater than 50 ppm were removed from the site.

## **BASIS FOR TAKING ACTION**

### **Remedial Investigations**

The focus of the 1984/85 RI was to assess the types of contaminants present at the site, the lateral and vertical extent of the contaminants, the rate of movement of the contaminants, contaminant pathways away from the source (fill material) and the potential impact upon the residents. The following general findings resulted from the Remedial Investigations:

- 1) Within the fill material, a wide variety of Priority Pollutant volatile and semi-volatile organic compounds and various Priority Pollutant metal concentrations were found in the soil and groundwater samples ranging from near surface and at shallow depths within the fill.
- 2) The site is underlain by a water table aquifer, which ranges from 20 to 50 feet in depth, and a deeper sand aquifer from 80 to 250 feet in depth. In the shallow sand-and-gravel aquifer, the groundwater flows to the south at about one to two feet per day. The groundwater in the deeper aquifer flows toward the west at less than one-foot per day. A uniform semi-confining clay layer that is about 30 feet thick is found between these two aquifers.
- 3) One well installed through the fill material and completed beneath the fill in the semi-confining bed had concentrations of metals and organics well in excess of drinking water standards. A sample of leachate seeping from the fill material and migrating into the sludge pond had lead concentrations that exceeded the primary drinking water

standards, concentrations of cadmium approaching the primary drinking water standards, and phenol, ethyl benzene and toluene in concentrations exceeding 100 ppb.

- 4) None of the monitoring wells around the perimeter of the site had any indication of contamination attributed to the disposal activities of the Site.
- 5) Fifteen nearby private wells were screened for volatile organics and seven were selected for complete priority pollutant analysis. No contamination was found in any of the wells. Additional protection is provided in that almost all the residents in the vicinity of the Site are on public water supply that pulls water from a deep well located approximately one mile southeast of the site.
- 6) Extraction Procedure Toxicity analysis of the fill material samples revealed the presence of cadmium and lead. In one sample, the cadmium had a concentration of 0.63 mg/l, and the lead concentration had a concentration of 4.11 mg/l. These values approached, but did not exceed concentrations which would have designated the fill material a hazardous waste (1.0 mg/l for cadmium, 5.0 mg/l for lead).

In summary, the RI report concluded that the investigations conducted at the Site confirmed that the contaminants dumped at the site from 1973 to 1979 had not migrated off-site. The reported factors favoring the immobility of the contaminants included:

- 1) the clay spoils covering the contaminants, which greatly limit the amount of flushing of chemicals into the groundwater;
- 2) the relative low permeability of the fill material, which acts as a deterrent to lateral groundwater flow (there is evidence that groundwater inflow towards the site is deflected around the fill material rather than migrating through the site);
- 3) the lack of surface drainage features away from the site, i.e., lack of chemical transport via streams away from the site; and
- 4) the high volatility of the more mobile organic compounds tend to lead to "volatilization" in extremely short distances.

In reference to the second conclusion from the RI, six recent potentiometric maps were constructed with the water level data collected from April 1997 to October 2003. These maps do not indicate that the shallow groundwater inflow is reflected around the site, as was depicted during the time of the RI. This pre-remediation groundwater mounding condition at the site was most likely a characteristic of the open landfill which served as a recharge area as precipitation moved slowly through the fill creating a mounding affect. After installation of the landfill cap, the water table has returned to a more normal flow pattern with the absence of mounding or artificial recharge in the landfill.

## **Feasibility Study**

Feasibility Study (FS) was conducted from September to December 1985. Fifteen remedial alternatives were screened using the following criteria: 1) technical feasibility, 2) public health effects, 3) environmental and public health effects, 4) institutional and 5) cost. Fourteen of the 15

alternatives were analyzed in greater detail. This process included: 1) technical feasibility, 2) public health, 3) environmental, 4) institutional, and 5) cost. After a thorough evaluation, alternative 9 was chosen. This alternative consisted of pumping the sludge pond water to a settling/filtration basin prior to discharging the clean effluent to the large pond on-site, installing a leachate collection system and limestone bed/aeration treatment unit with discharge to the pond, placing a natural cap on the fill and sludge pond areas and implementing a groundwater monitoring and sampling program during remedial design and construction phase and post closure. It was concluded that this alternative was technically feasible, alleviated all existing potential health effects, presented no new public health hazards and substantially reduced the risk to surface and groundwater.

### **Baseline Risk Assessment**

Because of the accessibility of public water supply in this area, it was considered unlikely that residents would ever be exposed to contaminated water in the future. Therefore, a risk assessment was not conducted as part of the RI to evaluate the public health and environmental risks associated with constituents detected in the groundwater.

## **IV. REMEDIAL ACTIONS**

The following subsections summarize the remedial actions for the site, including remedy selection, remedy implementation, and operation and maintenance.

### **Remedy Selection**

The ROD was signed on September 26, 1986, and addressed on-site soil and sludge material and groundwater.

The major components of the implemented remedy, including subsequent Operation & Maintenance (O&M) components, included the following:

- 1) Consolidation of stabilized sludge and soil into one sludge pond.
- 2) Excavation and stabilization of contaminated 7,547 cubic yards of sludge material and soil from the site sludge pond.
- 3) Construction of a synthetic cap over the landfill.
- 4) Construction of a gas venting system.
- 5) Implementation and maintenance of access controls (e.g., security fencing).
- 6) Maintenance of monitoring wells, landfill cover, leachate collection system, gas venting system.
- 7) Implementation of a groundwater monitoring program which included shallow monitoring wells MW-1A, MW-2A, MW-4A, MW-6A, MW-7A, MW-17 and MW-18.

Institutional controls to control future use of the property were also pursued. Specifically, on December 16, 1991, a Conservation Easement was signed by the owners of the property, Mr. Walter Dugger and his wife Mrs. Celia Dugger. An amended Conservation Easement, recorded on July 23, 1992, was granted by Walter and Celia Dugger to the U.S. In essence, this proprietary control places strict limits on future use of the site which might impact the remedy.

### **Remedy Implementation**

Remedial action activities were implemented for and activities were conducted in accordance with the ROD and associated remedial design and remedial action plans. The settling defendant contracted with Clean Sites Environmental Services (CSES) to perform construction management, contract administration and field and laboratory testing. The Remedial Action construction start date was May 17, 1990, and the completion date was March 28, 1991.

### **Operation and Maintenance**

The settling defendant contracted with CSES to perform site O&M. The operable document for conducting O&M is the O&M Plan, dated August 1990. The 1990 O&M plan incorporates all EPA and State quality assurance and quality control procedures and protocols.

The O&M requirements for the Pioneer Sand Site include the following major actions:

- 1) Semi-annual sampling and testing of shallow groundwater monitoring wells and visual analysis for light non-aqueous phase liquids (LNAPL) in the six risers.
- 2) Routine maintenance of the leachate collection and gas collection and vent system.
- 3) Periodic mowing and inspection of the cap area for erosion and stressed vegetation.
- 4) Fertilize twice a year, once in the fall and in the spring. Reseed annually in the fall.

Semi-annual monitoring for indicator parameters was initiated in October 1991. The groundwater monitoring portion of the remedy consisted of collecting baseline groundwater data from five wells (2 background and 3 compliance wells) on a semi-annual basis for a period of five years. The purpose of the baseline data was to determine concentration variability and to evaluate the effectiveness of the remedy. Semi-annual groundwater monitoring has continued through the October 2003 sampling event. Analytical results for the indicator parameters are to be compared to actions levels. The following sections identify and explain the indicator parameters and associated action levels.

### **Indicator Parameters**

The indicator parameters are applicable to both the groundwater monitoring program and for use in triggering leachate treatment.

The ROD, on page 50, discusses groundwater monitoring. The ROD specifies that the following indicator parameters will be analyzed as part of groundwater monitoring:

*“Metals: Chromium, zinc, lead*

*Organics: Priority Pollutant Acid Extractables, Priority Pollutant Purgeables, Pesticides and PCBs.”*

According to Section 4.3 of the 1990 O&M Plan, after pre-design studies were conducted in 1989, only total and dissolved cadmium and chromium, and volatile organic aromatics were chosen as indicator parameters in the monitoring program. As such, action levels were established for several volatile organics (e.g., benzene, toluene, etc.). Action levels were also established for two inorganics: cadmium and chromium.

Volatile organics, like benzene, were selected for as indicator parameters because such soluble volatile contaminants were detected in the LNAPL or the leachate. If migration from the landfill were to occur, such soluble volatile contaminants would be the types of constituents detected in the groundwater monitoring system. Chromium and cadmium were considered representative of the entire inorganic profile and were used as indicator parameters. According to page 1-8 of the 1990 O&M Plan, the rationale for selecting chromium and cadmium as indicator parameters is as follows:

*“...Chromium was selected since it was the one metal that was found with frequency in monitor wells investigated to date.*

*Cadmium was selected as an indicator metal; that is, cleanup of cadmium to the action levels shown would satisfy the goals set by the ROD, since the other two metals the ROD*

*specifics, zinc and lead, were two other metals that were not found in significant quantities in the ground water."*

## Action Levels

The same action levels are used in groundwater monitoring and leachate treatment.

Groundwater: The 1990 O&M Plan references the Consent Decree (CD) which specifies that the groundwater monitoring system be operational, "...*complying with the relevant and appropriate requirements of 40 CFR Section 264, Subpart F.*" Essentially, this means that a detection monitoring program with sampling and analysis of the appropriate indicators is to be pursued. Generically, detection monitoring works as follows: If the detection monitoring system detects an indicator parameter above the specified action level, then compliance monitoring or corrective action is triggered. In the case of Pioneer Sand site, the detections of contaminants in groundwater above the action levels trigger leachate collection and treatment.

Page 4-4 of the 1990 O&M Plan establishes the action levels to be used for the indicator parameters in groundwater. In accordance with the ROD, where available, action levels in the 1990 O&M Plan were based on federal or state primary drinking water standards. Where such standards were not available, the action levels were based on Florida groundwater guidance concentrations (i.e., Guidance Concentrations for ground water issued by Florida Department of Environmental Regulation (FDER), February 1989).

The action level for chromium is the higher of the following two levels:

- 1) the background level in monitoring well MW-1A or
- 2) the Florida drinking water standard (i.e., 0.05 mg/L).

The action level for cadmium is the higher of the following two levels:

- 1) the background level in monitoring well MW-1A or
- 2) the Florida drinking water standard (0.010 mg/L)

Table 2 replicates a complete listing of all the action levels to be used in the groundwater detection monitoring system.

**Table 2**  
**Action Levels**

Contaminant	Action Levels (mg/L)
Chromium (total)	Background level or 0.05 <sup>1</sup>
Cadmium (total)	Background level or 0.010 <sup>1</sup>

Contaminant	Action Levels <sup>1</sup> (mg/L)
Benzene	0.001
Toluene	0.024
Chlorobenzene	0.010
Ethylbenzene	0.002
Xylenes	0.050

<sup>1</sup> – MCL in mg/L

Source: Pioneer Sand Company ROD, September 1986 and 1990 O&M Plan

mg/L = milligrams per liter

Leachate Treatment: On page 1-8 of the 1990 O&M Plan, the action levels for the indicator parameters for leachate treatment are established. The action levels for leachate treatment are the same as the action levels for groundwater monitoring.

The protocol for implementation of the leachate collection and treatment system, on page 1-11 of the 1990 O&M plan, states the following:

*“...if action levels are exceeded in any of the seven monitor wells, leachate will be collected and treated. When concentrations in all seven wells drop below the same action levels, collection and treatment operation will stop. Likewise, if LNAPL is detected in any of the six leachate collection system risers, collection and treatment will begin; similarly, it will stop when the LNAPL is no longer in evidence.”*

Also on page 4-1 of the 1990 O&M plan, the following is stated:

*“...Liquid samples will be collected quarterly during construction for four quarters, and semiannually the remaining years from each of the six leachate risers. The samples will be checked visually for the presence of LNAPL. Any evidence of LNAPL in the collection trench, or levels of contaminants found in the seven specified monitor wells in excess of action levels in Table 1-2 [Table 2 of the five year review] will trigger startup and operation of the system until action levels in all inspection points fall below action levels for two successive sampling events.”*

## Operating and Maintenance Costs

The annual O&M estimated costs from the ROD, dated September 1986, were estimated at \$24,900 per year. Annual groundwater monitoring costs were estimated at \$20,000 for the first year and \$10,000 per year for subsequent years. Well upgrading costs after year 10 is estimated at \$3,100.

In contrast, the 1990 O&M Plan prepared by the ERM Group for CSES provides an annual estimated O&M cost of \$77,816 for the first year and \$70,251 for all subsequent years. The O&M cost figures are estimated within  $\pm 30\%$  which allows for a range from \$54,076 to \$100,426 annually.

O&M costs presented in Table 3 for 1999 through 2003 were provided in August 2004 by CSES representative Mr. Scott Miller, the consultant to the PRP. The ROD estimated annual O&M costs are significantly less than the actual O&M costs reported for the last five years. Comparing the ROD's annual O&M costs to the reported O&M costs for the last five years, the actual average annual expenditures was \$35,172, which shows a range of \$18,904 to \$65,254 less costs than the ROD estimated costs with a range of  $\pm 30\%$ .

There has been appreciable savings by the O&M contractor. CSES attributes the savings to reduced mowing pursuant to a recommendation in the First Five Year Review Report. To a lesser extent, some savings were realized by discontinuance of reseeding and fertilizing of the cap. There is no indication that the 1990 O&M Plan was revised to reflect this discontinuation.

**Table 3**  
**Operation and Maintenance Costs**

Dates		Total Cost Rounded to Nearest Dollar
From	To	
Jan 1999	Dec 1999	\$74,660
Jan 2000	Dec 2000	\$40,952
Jan 2001	Dec 2001	\$14,924
Jan 2002	Dec 2002	\$21,501
Jan 2003	Dec 2003	\$23,824

## **V. PROGRESS SINCE THE FIRST FIVE-YEAR REVIEW**

The following protectiveness statement from the initial five-year review for the Pioneer site was included in a memorandum from EPA signed December 22, 1999:

*"The remedies at the Pioneer Sand Superfund Site remain protective of human health and the environment. The cap appears to be effective at containing contaminants, preventing infiltration of rainwater, and preventing direct contact with contaminated soils. The leachate system is operating as intended. Institutional controls at the site remain in place and are effective".*

Groundwater monitoring has continued since October 1999 as recommended in the initial five-year review. The monitoring wells continue to be sampled semi-annually and results are reported in the semi-annual reports. The last semi-annual report reviewed for the second five-year review covered the October 2003 sampling event.

## **VI. SECOND FIVE-YEAR REVIEW PROCESS**

The second five-year review was conducted by the USACE under guidance from the EPA Remedial Project Manager for the Pioneer Sand Company site. The five-year review process consisting of administrative components, document review, data review, site inspection, and interviews is described in the following subsections. The last semi-annual report reviewed for the second five-year review covered the October 2003 sampling event.

### **Administrative Components**

The USACE led the Pioneer Sand Company Site Five-Year Review. The Florida Department of Environmental Protection (FDEP), CSES, and the EPA Community Involvement Coordinator were notified by the EPA RPM of the initiation of the five-year review for the site. A public notice was issued in April 2004 by EPA to notify the community of the second five-year review for the Pioneer Sand Company site.

A schedule was established by the USEPA to facilitate the five-year review process. Tasks included document search, document review, site inspection, interviews, and report preparation including preliminary draft, draft and final versions. The review implementation schedule extended through November 2004.

**Table 4**  
**Five-Year Review Key Personnel**

<b>Name</b>	<b>Organization</b>	<b>Role</b>
Wesley Hardegree	USEPA	Remedial Project Manager
Scott Miller	CSES	Site Manager
Juan Payne	USACE	Geologist/Author of Five Year Review Report
Theresa Pepe	FDEP	Project Manager

### **Document and Data Review - Groundwater**

The second five-year review consisted of a review of relevant documents including decision documents, monitoring reports, site inspection reports, as-built drawings and O&M records. Attachment 1 provides a list of all documents reviewed for this effort. The monitoring system is tied to action levels for triggering operation of the leachate treatment system (or compliance monitoring/corrective action). The action levels, established in the 1990 O&M Plan pursuant to the ROD, were reviewed and compared to current Applicable or Relevant and Appropriate Requirements (ARARs).

Historical data for groundwater from 1999 through 2003 was reviewed based on current ARARs for the site (see Table 5). Overall, the inorganic data for groundwater show events where the levels of total chromium and cadmium exceeded the background levels found in upgradient well MW-1A (i.e., the background well). Organics were detected during several sampling events. For

example, well MW-18 had benzene detected in 5 straight, and 6 total, sampling events (and the concentration exceeded the benzene MCL on 4 occasions). MW-18 is a down gradient well located at the toe of the cap.

**Table 5**  
**Groundwater Sampling Results**

Monitoring Well	Contaminant <sup>2</sup>	<u>Sampling Dates</u>								
		Nov 1999	May <sup>5</sup> 2000	Nov <sup>5</sup> 2000	May <sup>5</sup> 2001	Oct <sup>5</sup> 2001	Apr <sup>5</sup> 2002	Oct 2002	Apr 2003	Oct 2003
<b>MW-1A<sup>1</sup></b> (Background)	Cadmium	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Chromium	<10	ND	<10	<10	17	<10	17.9	11.9	<10
<b>MW-2A</b>	Cadmium	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Chromium	<10	<b>20.9<sup>4</sup></b>	<10	<b>104<sup>3</sup></b>	<b>258<sup>3</sup></b>	<b>38.8</b>	<b>37.7</b>	<b>64.6<sup>3</sup></b>	<b>41.6</b>
<b>MW-4A</b>	Cadmium	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Chromium	<5	<10	<10	<10	15.8	<b>12.8</b>	<b>22.2</b>	<b>28</b>	<10
<b>MW-6A</b>	Cadmium	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Chromium	<10	<10	<10	<10	<10	<10	<10	<10	<10
<b>MW-7A</b>	Cadmium	<b>34.8<sup>3</sup></b>	<5	<b>13.7<sup>3</sup></b>	<5	<5	<5	<5	<5	<5
	Chromium	<10	<b>36.3</b>	<10	<b>29.8</b>	<b>110<sup>3</sup></b>	17.1	<10	<10	<10
<b>MW-17</b>	Cadmium	<5	<b>215<sup>3</sup></b>	<5	<5	<5	<5	<5	<5	<b>17.6<sup>3</sup></b>
	Chromium	<b>37.8</b>	<b>24.9</b>	<10	<b>44.7</b>	<b>28.5</b>	<b>14.2</b>	<10	<10	<b>7.7</b>
<b>MW-18</b>	Cadmium	<5	<b>41.5<sup>3</sup></b>	<5	<5	<5	<5	<5	<5	<5
	Chromium	<10	<b>80.6<sup>3</sup></b>	<10	<b>32.8</b>	<b>59.8<sup>3</sup></b>	<b>41.5<sup>3</sup></b>	<10	<10	<10
	Benzene	<1	<b>0.68</b>	<b>1.1<sup>3</sup></b>	<b>0.96</b>	<b>4.1<sup>3</sup></b>	<b>2.6<sup>3</sup></b>	<0.5	<b>1.2<sup>3</sup></b>	<1
	Ethylbenzene	<1	<1	<1	<b>9<sup>3</sup></b>	<1	<0.5	<0.5	<1	<1
	Toluene	<1	<1	<b>0.72</b>	<b>4.1</b>	<1	<0.5	<0.5	<1	<1
	M-p-xylene	<2	<b>1.8</b>	<1	<b>3.3</b>	<b>16.6</b>	<b>2.3</b>	<0.5	<1	<1
	O-xylene	<2	<b>1.5</b>	<1	<b>5.5</b>	<1	<b>1.2</b>	<0.5	<1	<1

<sup>1</sup> Upgradient or background well located north of the Pioneer site.

<sup>2</sup> Results reported for only those contaminants that were detected during laboratory analysis.

<sup>3</sup> Indicates a contaminant level that exceeds the action level at the site.

<sup>4</sup> Bold indicates those contaminants that exceed the background levels at the site.

<sup>5</sup> Water levels recorded on these dates were below the bottom of the leachate collection trench, which is at an Elevation of 45 feet above mean sea level.

Note: Results are reported in parts per billion (ppb).

Since November 1999, chromium has exceeded the sampling event background levels in 5 of the 6 monitoring wells at the site. Chromium was above the corresponding event background level as following:

MW-2A - 7 of the 9 sampling events or 78% of the time.

MW-4A - 3 of the 9 events or 33% of time.

MW-7A - 4 of the 9 events or 44% of the time;  
MW-17 - 6 of 9 or 67% of the time,  
MW-18 - 4 of 9 events or 44% of the time.

Chromium exceeded the MCL specified in the 1990 O&M Plan in MW-2A in 3 of the 9 sampling events or 33% of the time. In MW-7A, chromium concentrations exceeded the MCL specified in the 1990 O&M Plan 11% of the time or in one sampling event, and in MW-18 chromium exceeded the MCL specified in the 1990 O&M Plan in 2 of the 9 sampling events or 22% of the time.

Since November 1999, cadmium has exceeded the sampling event background levels in 3 of the 6 monitoring wells at the site. Cadmium was above the corresponding event background level as following:

MW-7A - 2 of the 9 sampling events or 22% of the time.  
MW-17 - 2 of the 9 events or 22% of time.  
MW-18 - 1 of the 9 events or 11% of the time;

Cadmium was above the MCL specified in the 1990 O&M Plan in MW-7A in 2 sampling events or 22% of the time; and in MW-17 it was exceeded the MCL specified in the 1990 O&M Plan in 2 sampling events or 22% of the time, and in MW-18 cadmium exceed the MCL specified in the 1990 O&M Plan in 1 of the 9 sampling events or 11% of the time. Use of the newer cadmium MCL (i.e., 5 ppb) does not change the above presentation of detections or exceedances (also see Section VII, Question B of this five year review).

It should be noted that the above discussed detections of total chromium and total cadmium are not represented in the dissolved phase chromium and cadmium concentrations. This suggests that turbidity in the samples analyzed may be the source of the detections for total chromium and total cadmium. Starting with the October 2004 sampling event, low flow sampling protocols were begun to lower the turbidity in the groundwater samples.

Volatile organics were not detected in the background well during any of the 9 sampling events. However, volatile organics were detected in one of the point of compliance wells, MW-18. As previously mentioned, MW-18 is a down gradient well located at the toe of the cap. In MW-18, benzene was detected in 6 of the 9 sampling events (67% of the time), and the action level for benzene specified in the 1990 O&M Plan was exceeded in 4 of the 9 sampling events. Ethylbenzene was detected in 1 sampling event, and this detection exceeded the O&M specified action level for ethylbenzene. Toluene was detected twice or 11% of the time. None of the toluene detections exceeded the 1990 O&M specified action level for toluene. The constituent M-p-Xylene was detected in 4 of the 9 sampling events or 44% of the time and exceeded the O&M specified action level in 1 sampling event. O-xylene was detected 33% of the time or in 3 sampling events. None of the detections exceeded the O-xylene 1990 O&M specified action level. Use of the newer MCLs for ethylbenzene, toluene and xylene (i.e., 700 ppb, 1,000 ppb and 10,000 ppb, respectively) does not change the above presentation of detections or exceedances except with regard to ethylbenzene. There were no detections of ethylbenzene

exceeding the newer MCL for ethylbenzene (also see Section VII, Question B of this five year review).

### **Document and Data Review - Surface Water**

During the FS it was determined that the pond located to the south of the cap was essentially free of contamination. Therefore, no surface water sampling has been performed since construction of the remedy.

### **Site Inspection**

The site inspection was conducted on May 20, 2004. Attendees included Wesley Hardegree (USEPA), Juan Payne (USACE), Theresa Pepe (FDEP), and Scott Miller (Clean Site Environmental Services, Inc.). The purpose of the inspection was to evaluate the site conditions and collect information to assess the protectiveness of the remedy. During the site inspection, the remedial systems, groundwater monitoring wells and general site conditions were observed and inspected. The inspection team evaluated the landfill cover, the leachate collection system, the groundwater monitoring system and the site drainage and fencing. Notes and observations from the site inspection were recorded on the Site Inspection Check List provided in Attachment 2. Photographs were taken by Juan Payne and are provided in Attachment 3.

### **Cover System**

The landfill cover consists of a vegetative cover on top of an 18-inch thick soil layer and a geomembrane underlain by a 12-inch sand layer which was placed over the fill material. The cap was inspected for erosion, cracking, settlement, ponding of water, vegetative growth. The site has a vegetative cover (see Photograph 1) consisting predominantly of a stand of weeds which appeared stressed due to lack of water and had several areas where it was noticeably thinned. There is excessive vegetative growth cap along the rip rap surface drains on the cap. No major areas of erosion were noted. The perimeter fencing around the property had breaches in a couple locations that were cut by trespassers. The locks and gates are in proper working condition. Warning signs are posted along the inner perimeter fence line (see Photographs 1, 2, 3, 11, 15), but several signs were missing. The access road to the site is in good condition.

### **Gas Collection and Venting and Leachate Collection Systems**

The gas collection and venting system consists of thirteen, 4-inch diameter schedule 80 PVC pipes spaced on 75-foot centers and are located along the western and northern site boundaries. The vents extend from about 18-inches above ground surface to below the landfill cover four feet into a gravel filled trench that intercepts the top of the fill material along the site boundaries. The vent pipes were inspected and one pipe had a vent cap missing. The missing vent cap had been noted in the first five year review.

The leachate collection trench is a passive system 2 feet wide. The trench has a bottom depth of 45 feet above mean sea level. It is filled with 5 feet of ¾-inch crushed stone/pea gravel surrounding a 4-inch corrugated polyethylene pipe perforated wrapped with a geotextile fabric.

Treatment of leachate has not been needed since leachate has never been collected by the system. The two manholes and the six sampling ports in the leachate collection system were observed and one sampling port was inspected. No deficiencies were noted.

### **Monitoring Wells**

The monitoring wells identified during the site inspection that are part of the groundwater sampling program were MW-1A, MW-2A, MW-4A, MW-6A, MW-7A, MW-17, and MW-18 (see Photographs 7, 10, 14, 15, 16, 18). The condition of the exposed portions of the monitoring wells has degraded over the years (e.g., loss of paint, rust forming). All monitoring wells except MW-2A were secured with a lock. MW-2A was recently damaged by earthmoving equipment working on development of a subdivision east of the site.

The site inspection confirmed that O&M activities have generally been carried out in accordance with the ROD and the 1990 O&M Plans. Yet some deficiencies were noted, and recommendations to address these deficiencies are listed in Section IX, Recommendations and Follow-up Actions. There are no unexpected changes in the O&M scope or cost that have occurred to suggest ineffectiveness of the remedy.

### **Interviews**

During the five-year review process, several individuals were interviewed in May and July 2004 concerning the Pioneer Sand Company site. Individuals interviewed included the O&M site manager from CSES and residential neighbors to the Site. Some issues and concerns were expressed during a few of the interviews.

The O&M site manager expressed satisfaction with the remedy, O&M, and monitoring results.

In general, residential property owners next to the Site do not feel well informed about the status and activities at the Site. There were also concerns expressed about the heavy vegetation that has grown up along the perimeter fence.

Details of all interviews are provided in Attachment 4.

## VII. TECHNICAL ASSESSMENT

The following Questions A, B, and C were answered to provide a technical assessment of the site remedy.

### **QUESTION A: IS THE REMEDY FUNCTIONING AS INTENDED BY THE DECISION DOCUMENTS?**

#### **Remedial Action Performance**

The remedy serves several basic purposes:

- 1) to eliminate human exposure to the source material,
- 2) to eliminate gas build up under the cap,
- 3) to capture and treat leachate generated by the capped material, and
- 4) to eliminate or minimize migration of contaminants to groundwater.

The remedy is functioning as designed with regard to eliminating human exposure to source material and preventing gas material. Although water is present in the leachate collection system, leachate (i.e., LNAPL) has never been collected by the leachate collection system.

The 1990 O&M Plan (page 1-5) states that:

*“The premise of the remedies specified in the ROD is that contaminant migration will not occur, since it has not occurred and as noted by the feasibility study (FS) contractor, if offsite migration were to occur, it should have done so by now: the chemicals in the landfill have been there for a decade, and samples over a five year period show no evidence of migration.”*

Monitoring over the past five years has shown there to be the presence of low level VOCs during periods of low groundwater levels in MW-18 and the presence of cadmium and chromium at concentrations occasionally exceeding their respective background and action levels. This suggests that the landfill continues to serve as a source of groundwater contamination or potential groundwater contamination, and continued groundwater monitoring is needed.

Analytical results indicate that changes in the hydraulic conditions present at the site are creating a condition whereby releases are occurring intermittently. The following conceptual model is proposed as an explanation for the groundwater detections and non-detections observed since 1999.

- 1) The pond does not have a surface water discharge.
- 2) Any runoff or rainfall that enters the pond either evaporates or infiltrates into the ground.

- 3) An increase in the elevation of the pond's surface water level during rain events leads to increased infiltration and subsequent rise in the elevation of the surrounding water table.
- 4) With the water table elevated, the leachate collection system will become flooded and some source material within the cap will likely become saturated.
- 5) As the pond surface water level falls, the fall in the water table under the cap is delayed slightly. A gradient is created from the cap to the pond. The groundwater, now containing some dissolved constituents from the leachate collection system or newly saturated source material under the cap, migrates toward the pond and is detected by monitoring wells along the southern edge of the cap.

It is likely that if the collection trench were sampled when water is present, then similar concentrations to that observed in the groundwater sampling at the toe of the cap would be detected.

### **System Operations**

The site inspection demonstrated that most O&M activities have been conducted in accordance with the ROD and O&M Plans; however, there needs to be improvement in a few activities at the Site. The needed areas of improvement are provided in Section IX, Recommendations and Follow-up Actions.

There have been no changes, either expected or unexpected, that have occurred in cost or scope of the O&M to suggest compromised effectiveness of the remedy.

### **Opportunities for Optimization**

Groundwater sampling frequency is sufficient to monitor remedy performance; however, failure of the ROD and the O&M Plan to include down gradient well MW-5A within the groundwater monitoring system results in an absence of data that would show if there are no contaminants leaving the site. Inclusion of the shallow downgradient well MW-5A into the groundwater monitoring system should provide sufficient data to assess the success of the remedial action. The only other opportunity for optimization identified were re-developing the monitoring wells and utilization of a low flow sampling techniques.

### **Early Indicators of Potential Issues**

No early indicators of potential issues that could lead to remedy failure or jeopardize the protectiveness were identified during this five-year review. In contrast to the conceptual model at the time of remedy selection, the landfill does appear to serve as the source of intermittent releases to groundwater.

### **Implementation of Institutional Controls and Other Measures**

The institutional (i.e., the Conservation Easement) and access controls (i.e., fencing) at the site provide adequate protection and control of the remedy. No other actions were identified for the site.

**QUESTION B: ARE THE EXPOSURE ASSUMPTIONS, TOXICITY DATA, CLEANUP LEVELS, AND REMEDIAL ACTION OBJECTIVES USED AT THE TIME OF THE REMEDY STILL VALID?**

**Changes in Exposure Assumptions/Pathways**

Changes have not occurred at the site which would change or adversely affect the previously identified assumptions leading to site exposure pathways. In other words, the measures taken in the remedy to protect human health and the environment remain valid and protective. The contaminants of concern remain the same, as well as land usage, human usage of resources, trespasser scenarios, etc.

**ARARs in the ROD Requiring Review**

The following understanding was provided on page 39 of the ROD:

*"The EPA National Primary Drinking Water Standards apply to public water supply systems. Since the groundwater underlying the Site is used for only private water supply, the MCLs do not specifically apply. However, the Florida State Water Quality Standards for Class G-II Groundwater, F.A.C. 62-520.420 which are equal or more stringent than the MCLs are applicable standards..."*

This logic was used during establishment of action levels in the 1990 O&M Plan. For the second five year review, the groundwater sampling results from November 1999 through October 2003 were evaluated against the action levels established in the ROD and identified in the 1990 O&M plan.

As per the ROD, waste disposed at the site included various phenols and resin compounds as well as PCBs. The ROD further specified that the wells be monitored for metals (i.e., chromium, zinc and lead) and organics (priority pollutant extractables, priority pollutant purgeables, pesticides and PCBs). As previously mentioned, according to Section 4.3 of the 1990 O&M Plan, after pre-design studies were conducted in 1989, only total and dissolved cadmium and chromium, and volatile organic aromatics were chosen as indicator parameters in the groundwater monitoring program. Tables 2 and 6 contain the action levels from the ROD and the 1990 O&M Plan.

**Changes in Toxicity Data, Cleanup Levels**

The toxicity basis for some of the action levels established in the ROD and 1990 O&M Plan has changed. Specifically, the action levels for chromium, toluene, chlorobenzene, ethylbenzene and xylene have all risen since the 1986 ROD and the 1990 O&M Plan. The action level for cadmium has decreased. The foundations for the action levels listed in the 1990 O&M Plan for chromium, cadmium, benzene were the National Primary Drinking Water Regulations as defined in 40 C.F.R. Part 141 and the Florida Primary Drinking Water Standards as defined in Chapter

62-550. The foundation for the action levels found in the 1990 O&M Plan for toluene, chlorobenzene, ethylbenzene and xylenes was from the following state guidance:

Guidance Concentrations for ground water issued by Florida Department of Environmental Regulation (FDER), February 1989.

Table 6 present the action levels and the current ARARs for groundwater.

The new drinking water standards for chromium, toluene, chlorobenzene, ethylbenzene and xylenes do not affect remedy protectiveness evaluation because the newer values are higher than the action levels established in the 1990 O&M Plan. For example, if the new MCLs are taken into account, the concentrations of chromium and many of the organics with new MCLs appear to be less of a concern from a cleanup perspective (i.e., the groundwater detections for chromium, toluene, chlorobenzene, ethylbenzene and xylenes are farther below their respective current MCLs).

The current cadmium MCL (0.005 ppm) is slightly lower than the MCL at the time of the ROD and 1990 O&M Plan (0.01 ppm); however, given the levels and frequency of cadmium concentrations detected in groundwater, the MCL decrease does not affect the protectiveness decision.

**Table 6**  
**Comparison of Original Action Levels to Current Values for Establishment of**  
**Action Levels in Groundwater/Leachate**

Record of Decision and Operational Maintenance Plan Action Levels				Current Values for Establishment of Action Levels		
Contaminant	Action Level (mg/L)	Source	Year	ARAR (mg/L)	Source	Year
Chromium (total)	0.05	Federal and State Primary Drinking Water Standard <sup>1</sup>	1986	0.1	Federal and State Primary Drinking Water Standard	2004
Cadmium (total)	0.01	Federal and State Primary Drinking Water Standard	1986	0.005	Federal and State Primary Drinking Water Standard	2004
Benzene	0.001	FL Guidance Concentration <sup>2</sup>	1986	0.001	State Primary Drinking Water Standard	2004
Toluene	0.024	FL Guidance Concentration	1986	1	State Primary Drinking Water Standard	2004
Chlorobenzene	0.01	FL Guidance Concentration	1986	0.1	Federal Primary Drinking Water Standard	2004

Ethylbenzene	0.002	FL Guidance Concentration	1986	0.7	Federal and State Primary Drinking Water Standard	2004
Xylene (Total)	0.05	FL Guidance Concentration	1986	10	Federal and State Primary Drinking Water Standard	2004

<sup>1</sup> National Primary Drinking Water Regulations, 40 C.F.R. Part 141, and Florida Primary Drinking Water Standards, Chapter 62-550.310, F.A.C.

<sup>2</sup> Guidance concentrations for ground water issued by Florida Department of Environmental Regulation (FDER), February 1989.

ARARs = Applicable or Relevant and Appropriate Requirements

C.F.R. = Code of Federal Regulations

MCL = maximum contaminant level

mg/L = milligrams per liter

## Remedial Action Objectives (RAO)

The remedy has several basic objectives:

- 1) to eliminate human exposure to the source material,
- 2) to eliminate gas build up under the cap,
- 3) to capture and treat leachate generated by the capped material, and
- 4) to eliminate or minimize migration of contaminants to groundwater.

These basic objectives are as valid in 2004 as they were when the remedy was selected

## ARARS in the ROD *not* Requiring Review

There are no ARARs identified in the ROD which are not being considered for review

## **QUESTION C: HAS ANY OTHER INFORMATION COME TO LIGHT THAT COULD CALL INTO QUESTION THE PROTECTIVENESS OF THE REMEDY?**

The recent (i.e., 2004) development of a residential subdivision along the east side of the Site emphasizes the need for a community outreach program and raises the importance of insuring that the institutional controls and access controls are protected and maintained.

## Technical Assessment Summary

According to the data review, the remedy appears to be functioning to prevent rain water from contacting fill material. The remedy is also keeping exposures to contamination from occurring. However, a premise underlying the 1986 remedy is that contaminant migration will not occur. This premise appears to be too optimistic. Documented fluctuation in the groundwater level of up to 10 feet gives rise to the possibility that when the groundwater level later falls, contaminants collected in the leachate can move downgradient when the groundwater level falls below the bottom of the collection trench, essentially bypassing the leachate collection system. Furthermore, potentiometric maps drawn using water level data indicate that the shallow

groundwater inflow is not reflected around the landfill, as was depicted in the conceptual model in the RI phase, but in fact flows beneath the landfill area. This condition increases the risk that the shallow groundwater flowing beneath the Site can come in contact with contaminants.

Monitoring over the past five years has shown there to be the presence of low level VOCs during periods of low groundwater levels in MW-18 and the presence of cadmium and chromium at concentrations occasionally exceeding their respective background and action levels specified in the 1990 O&M Plan. This suggests that the landfill continues to serve as a source of groundwater contamination or potential groundwater contamination, and continued groundwater monitoring is needed. It is noted that the detections of VOC contaminants in downgradient monitoring wells at the edge of the landfill were at a time when the groundwater level dropped below the bottom elevation of the leachate collection trench.

Also contrary to earlier assumptions that the Site is not subject to flooding, there have been occasions when high water resulted in inundation of shallow wells MW-17 and MW-18, and such flooding has prevented sampling. Recent photographs 18 and 19, taken on September 17, 2004, after Hurricane Ivan passed over the Site shows the water level in the pond to have risen up to the edge of the landfill cap and over monitoring wells MW-17 and MW-18. Semi-annual reports from October 1996, April 1998, and April 1999 also document periods of high water in the pond that at times precluded access to MW-17 and MW-18.

In summary, even though the landfill cap is effective at preventing surface water from contacting fill material, the hydraulic connection between the groundwater and the surficial waters in the pond coupled with the recorded rise in the groundwater appears to cause the groundwater to come in contact with lowest part of the fill material.

## VIII. ISSUES

There is a documented fluctuation in the water table at the Site of up to 10 feet, and monitoring wells MW-17 and MW-18, located at the toe of the landfill, have at times been inaccessible due to high water levels in the large pond. Due to the fact that there is a direct hydraulic connection beneath the surface water in the pond and the groundwater beneath the landfill cap, this situation promotes some concern of the possibility of leaching of contaminants during the rise and fall of the water table beneath the cap. This is in contrast to the statement in Section VII of the ROD which says in part:

*“...There does not appear to be any physical mechanism for transport offsite for the remaining low levels of PCB’s since the fill area is not subject to flooding or stream erosional processes.”*

These changes in the hydraulic condition at the site may account for the VOC contaminants that were detected in MW-18 in the sampling events of May 2000 through April 2002. The contaminants were detected during a period when the elevation of the water table dropped several feet below the bottom of the leachate collection trench which is set at an elevation of 45 feet. In the absence of analytical data from MW-5A, the shallow well downgradient of MW-18, it is not possible to determine if any contaminants have migrated beyond the site boundary. It should be noted that MW-5A was included in the October 2004 Semi-Annual Sampling Event.

Although the remedy is functioning to prevent rain water from contacting fill material and to keep exposures to contamination from occurring, a premise underlying the remedy is that contaminant migration will not occur. Monitoring over the past five years has shown there to be the presence of low level VOCs during periods of low groundwater levels in MW-18 and the presence of cadmium and chromium at concentrations occasionally exceeding their respective background and action levels. This suggests that the landfill continues to serve as a source of groundwater contamination or potential groundwater contamination, and continued groundwater monitoring is needed.

## IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The following recommendations are provided for the Pioneer Sand Company site:

1. Redevelop the following deep monitoring wells: MW-1B, MW-4B, MW-5B, MW-6B and MW-7B, and perform a one time sampling of these deep wells.
2. Address the following O&M issues:
  - a. Address changes needed to the 1990 O&M Plan. At a minimum, the O&M update/amendment should accomplish the following:
    - i. update the O&M Plan to acknowledge changes to the cleanup levels which would be used as actions levels today for the indicator parameters in the 1990 O&M Plan (e.g., present the current MCLs for indicator parameters along side the actions levels from the 1990 O&M Plan). This side by side comparison will assist the Agency in the protectiveness determination of future five year reviews.
    - ii. update the O&M Plan to add MW-5A, a shallow down gradient well, to the semi-annual groundwater monitoring program. It should be noted that MW-5A was included in the October 2004 Semi-Annual Sampling Event.
    - iii. update the O&M Plan to remove MW-2A from the groundwater monitoring system.<sup>1</sup>
    - iv. update of the O&M Plan to address the status of the outer perimeter fence. This update must specifically address whether or not the outer fence should remain part of the maintenance plan.
    - v. update the O&M Plan to include an assessment of the integrity of wells and protective covers for adverse impacts (e.g., severe rust). If the structural integrity of a well is found to be at risk, then corrective action should be taken.
  - b. Comply with the annual seeding and semi-annual fertilizing requirements of the cap cover as stated in the 1990 O&M Plan (see page 2-1 of the 1990 O&M Plan) or update the O&M Plan to reflect the desire to seed and fertilize on an "as-needed" basis.
  - c. Remove all trees and other vegetation growing in the rip rap flume which is potentially jeopardizing the integrity of the cap and site drainage (see page 2-2 of the 1990 O&M Plan).
  - d. Rehabilitate and upgrade the monitoring wells (see Section IX of the ROD where it states that "*Well upgrading will occur after 10 years.*"). At a minimum, this recommendation includes the following:

---

<sup>1</sup> CSES recommended that MW-2A be removed from the monitoring plan. In response, EPA generated a hydrograph from the groundwater elevations collected from all of the monitoring wells. Twelve groundwater monitoring elevations were reviewed (see Figure 1). No flow reversals were measured at MW-2A; therefore, EPA is amenable to removal of MW-2A from the monitoring plan.

---

- i. The protective cover for MW-2A should be replaced and all wells should be properly identified on the well cover.
    - ii. All shallow monitoring wells (i.e., MW-1A, MW-2A, MW-4A, MW-5A, MW-6A, MW-7A, MW-17 and MW-18) should be re-developed.
  - e. Replace the missing vent cap on the 4-inch PVC gas vent pipe located along the east-west line of gas vents. (This recommendation was noted in the first 5-year review.)
  - f. Check the security of the inner perimeter fence at least semi-annually when the monitoring wells are sampled. The fence conditions should be noted in the O&M semi-annual monitoring report.
  - g. Provide early notification to respective landowners when future sampling events are to occur so that access is not prohibited by loose animals.
  - h. Replace the signs where missing from the inner perimeter fence and update the phone number for FDEP on the sign on the gate.
3. Provide future Semi-Annual Groundwater Monitoring Reports which address the following issues:
- a. Submit semi-annual reports within three months of the sampling event instead of 6 months as has been the case over the past five years. This earlier submission will allow for more timely identification of any changes in the analytical results and will allow for any necessary modification(s) before the next sampling event.
  - b. Include a site location map and as-built site drawings for the landfill cap, leachate collection system and all monitoring wells.
  - c. Include potentiometric water level maps which clearly depict the groundwater gradient during each sampling event. (In an EPA letter to Clean Site Environmental Services, Inc. dated April 25, 2002, the RPM presented a similar request in which he wrote that, "*Water table information needs to be collected and presented in future semi-annual reports to clearly show the groundwater flow direction.*") (i.e., relevant and appropriate requirement Subpart F, 40 CFR §264.98(e)).
  - d. Include a comparison of concentrations to the action levels (i.e., relevant and appropriate requirement Subpart F, 40 CFR §264.98(f) and (g)). Interpretation of detections should be in relation to both the actions levels in the 1990 O&M Plan and the current MCLs. Use of the current MCLs will assist the Agency in the protectiveness determination of future five year reviews.
  - e. If needed based on comparison to the action levels, include a recommendation for further action (i.e., relevant and appropriate requirement Subpart F, 40 CFR §264.98(h)). For example, trigger groundwater re-sampling, trigger leachate sampling and/or treatment, trigger analysis of the ROD identified indicator parameters (i.e., PCBs, priority pollutant purgeables, and priority pollutant acid extractables), etc.
  - f. Utilize the conceptual model outlined in Section VII to interpret past and future groundwater monitoring results. As needed, perform further analysis and

evaluation to determine the affects that groundwater levels may have on the remedy's long term protectiveness.

4. Continue semi-annual monitoring of the shallow wells.
5. Improve community outreach program to insure the adjacent community landowners are informed about the site. (A similar recommendation was made in the first five year review.)

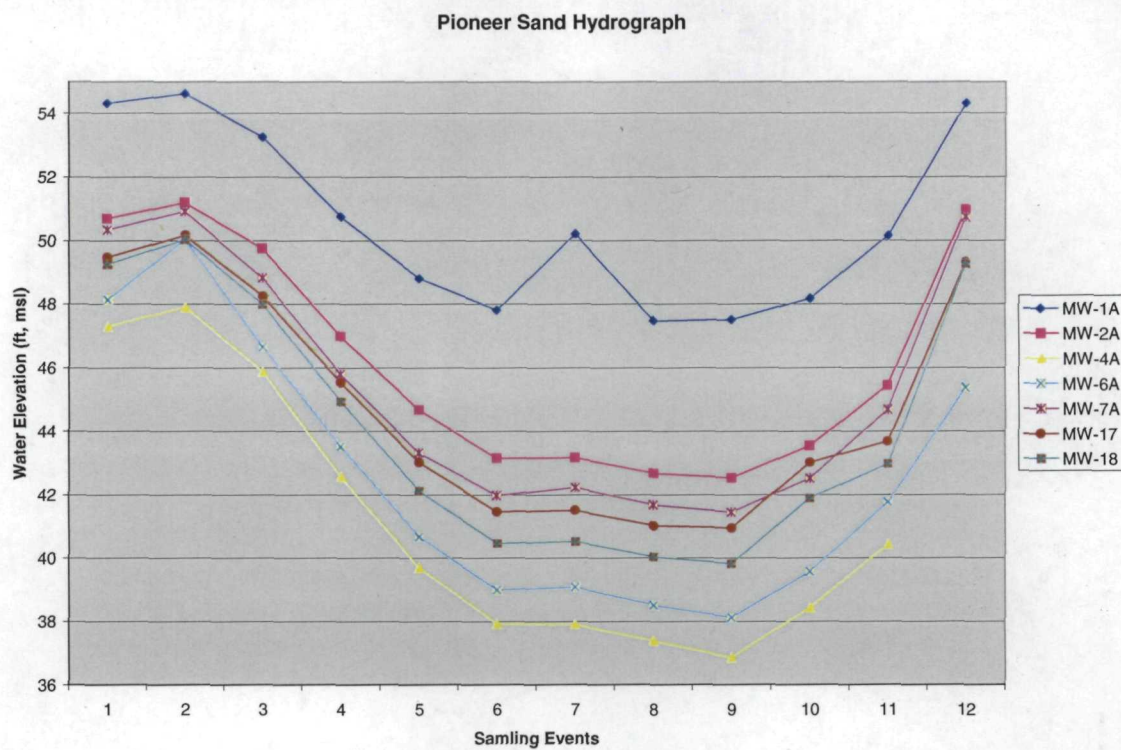


Figure 1 - Hydrograph

## **X. PROTECTIVENESS STATEMENT**

Although monitoring well data over the past five years indicate that concentrations of several contaminants have exceeded their respective action levels as expressed in the ROD and identified in the 1990 O&M Plan, a system is in place to monitor these intermittent releases of low contaminant levels emanating from the landfill. The remedy is functioning as designed and envisioned, and there is no evidence of potential or actual exposures occurring (e.g., there are no complete exposure pathways expected to result in unacceptable risk, the institutional controls and access controls are in place and maintained, etc.).

Because the remedy is protective, the site is protective of human health and the environment.

In a letter dated October 27, 2004, the FDEP concurred "...with the Recommendations and Follow-up Actions presented in the [five year review] report. They appear to be adequate for ensuring that the remedy remains protective of human health and the environment."

## **XI. NEXT REVIEW**

The third five-year review for the Pioneer Sand Company site is required by December 13, 2009, five years from the date of this review.

**ATTACHMENT 1**

**LIST OF DOCUMENTS REVIEWED**

## **Documents Reviewed**

- Clean Sites Environmental Services, Inc., 1990, Remedial Action Plan, Pioneer Sand Company Site, Pensacola, Florida, June 1991.
- Clean Sites Environmental Services, Inc., 1991, Acceptance Report For Completion of Sludge Stabilization, Pioneer Sand Company Site, Pensacola, Florida, May 1991.
- Clean Sites Environmental Services, Inc., 1991, Acceptance Report For Completion of the Leachate Collection Trench, Pioneer Sand Company Site, Pensacola, Florida, June 1991.
- Clean Sites Environmental Services, Inc., 1991, Acceptance Report For Completion of the Gas Collection and Venting System, Pioneer Sand Company Site, Pensacola, Florida, July 1991.
- Clean Sites Environmental Services, Inc., 1991, Acceptance Report For Completion of the Synthetic Cover System, Pioneer Sand Company Site, Pensacola, Florida, August 1991.
- Clean Sites Environmental Services, Inc., 1991, Report on the First Quarterly Sampling, Pioneer Sand Company Site, Pensacola, Florida, November 1991.
- Clean Sites Environmental Services, Inc., 1991, Report on the Confirmatory Sampling, Pioneer Sand Company Site, Pensacola, Florida, December 1991.
- Clean Sites Environmental Services, Inc., 1992, Report on the Second Quarterly Sampling, Pioneer Sand Company Site, Pensacola, Florida, April 1992.
- Clean Sites Environmental Services, Inc., 1992, Report on the Third Quarterly Sampling, Pioneer Sand Company Site, Pensacola, Florida, June 1992.
- Clean Sites Environmental Services, Inc., 1992, Report on the Fourth Quarterly Sampling, Pioneer Sand Company Site, Pensacola, Florida, August 1992.
- Clean Sites Environmental Services, Inc., 1996, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, October 1996.
- Clean Sites Environmental Services, Inc., 1998, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, April 1998.
- Clean Sites Environmental Services, Inc., 1999, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, April 1999.
- Clean Sites Environmental Services, Inc., 1999, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, October 1999.

- Clean Sites Environmental Services, Inc., 2000, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, April 2000.
- Clean Sites Environmental Services, Inc., 2000, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, October 2000.
- Clean Sites Environmental Services, Inc., 2001, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, April 2001.
- Clean Sites Environmental Services, Inc., 2001, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, October 2001.
- Clean Sites Environmental Services, Inc., 2002, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, April 2002.
- Clean Sites Environmental Services, Inc., 2002, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, October 2002.
- Clean Sites Environmental Services, Inc., 2003, Pioneer Sand Company Site, Semi-annual Report for Operation and Maintenance, April 2003.
- Clean Sites Environmental Services, Inc., 2003, Pioneer Sand Company Site, Semi-annual Report  
for Operation and Maintenance, October 2003.
- Environmental Resources and Management-South, Inc., 1989, Pioneer Sand Site, Pre-design Report, May 1989.
- Environmental Resources and Management-South, Inc., 1989, Memorandum of "Results of the June 1989, Pioneer Sand Liquid Level Evaluation" addressed to Mr. Doug Ammon of Clean Sites, Inc., July 1989.
- Environmental Resources and Management-South, Inc., 1990, Pioneer Sand Superfund Site Operation and Maintenance Plan, August 1990.
- Fetter, C. W., Jr., 1994, "Applied Hydrogeology", Prentice Hall, pp. 308-314.
- U.S. Environmental Protection Agency, 1999, Five Year Review, Pioneer Sand Company Superfund Site, Pensacola, Florida, December 22, 1999.
- U.S. District Court for the Northern District of Florida, 1988, Consent Decree, Pioneer Sand Company Site, Pensacola, Escambia County, Florida, Civil Action No. 88-30168WS, May 1988.
- U.S. Environmental Protection Agency, 1986, EPA Superfund Record of Decision, Pioneer Sand Company, EPA ID FLD056116965, Pensacola, Escambia County, Florida, September 26, 1986.

U.S. Environmental Protection Agency, 1991, Superfund Site Closeout Report, Pioneer Sand Company Site, Pensacola, Escambia County, Florida, December 1991.

U.S. District Court for the Northern District of Florida, 1991, Conservation Easement, Pioneer Sand Company Site, Pensacola, Escambia County, Florida, Civil Action No. 88-30168WS, December 1991.

U.S. District Court for the Northern District of Florida, 1992, Amended Conservation Easement, Pioneer Sand Company Site, Pensacola, Escambia County, Florida, Civil Action No. 88-30168WS, July 1992.

Woodward-Clyde Consultants, 1985, Site Investigation Report, Pioneer Sand, Pensacola, Florida, June 1985.

Woodward-Clyde Consultants, 1986, Feasibility Study, Pioneer Sand, Pensacola, Florida, June 1986.

**ATTACHMENT 2**  
**SITE INSPECTION CHECK LIST**

<b>I. SITE INFORMATION</b>							
<b>Site Name:</b> Pioneer Sand Company	<b>Date of Inspection:</b> May 20, 2004						
<b>Location and Region:</b> Pensacola, FL	<b>EPA ID:</b> FLD056116965						
<b>Agency, office or company leading the five-year review:</b> U.S. Environmental Protection Agency	<b>Weather/temperature:</b> Partly cloudy and humid						
<b>Remedy Includes</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> RCRA cover/containment  <input checked="" type="checkbox"/> Access controls  <input checked="" type="checkbox"/> Institutional controls  <input type="checkbox"/> Groundwater pump and treatment  <input type="checkbox"/> Surface water collection and treatment  <input type="checkbox"/> Other _____             </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Monitored natural attenuation  <input type="checkbox"/> Groundwater containment  <input type="checkbox"/> Vertical barrier walls (slurry wall)             </td> </tr> </table>		<input checked="" type="checkbox"/> RCRA cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls (slurry wall)				
<input checked="" type="checkbox"/> RCRA cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input type="checkbox"/> Groundwater pump and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other _____	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Groundwater containment <input type="checkbox"/> Vertical barrier walls (slurry wall)						
<input checked="" type="checkbox"/> Inspection team roster provided in Five-Year Review Report <input type="checkbox"/> Site map provided in Attachment 2							
<b>II. INTERVIEWS</b> (Check all that apply)							
<b>1. O&amp;M Site Manager</b> <u>N/A</u>  Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached							
<b>2. O&amp;M Staff</b> <u>N/A</u>  Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone   Phone no. _____ Problems, suggestions; <input type="checkbox"/> Report attached.							
<b>3. Local regulatory authorities and response agencies</b> (i.e., State and Tribal Offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.  Agency: _____ Contact: _____ <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; text-align: center;">Name</td> <td style="width: 33%; text-align: center;">Title</td> <td style="width: 33%; text-align: center;">Date</td> </tr> <tr> <td colspan="3">Problems, suggestions: <input type="checkbox"/></td> </tr> </table>		Name	Title	Date	Problems, suggestions: <input type="checkbox"/>		
Name	Title	Date					
Problems, suggestions: <input type="checkbox"/>							
<b>4. Other Interviews:</b> <input checked="" type="checkbox"/> Reports provided in Attachment 7							

○ Mr. Scott Miller	Site O&M Manager	20 May 2004
○ Mr. William Autry	Landowner	28 July 2004
○ Mrs. Marla Wood	Landowner	29 July 2004
○ Mr. Tracey Downs	Landowner	30 July 2004
○ Mrs. Mary Fane Booth	Landowner	29 July 2004
○ Mr. James Cotton	Landowner	29 July 2004
○ Mr. Larry Pearson	Landowner	29 July 2004

**III. DOCUMENTS & RECORD VERIFIED** (Check all that apply)

**1. O&M Documents**

<input checked="" type="checkbox"/> O&M Manual	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> As-built drawings	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
<input checked="" type="checkbox"/> Maintenance Logs	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A

Remarks \_\_\_\_\_

\_\_\_\_\_

**2. Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A

**Contingency Plan/Emergency Response Plan** ☐ Readily available ☐ Up to date ☒ N/A

Remarks \_\_\_\_\_

\_\_\_\_\_

**3. O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks \_\_\_\_\_

\_\_\_\_\_

**4. Permits and Service Agreements**

<input type="checkbox"/> Air Discharge Permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
<input type="checkbox"/> Other permits _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A

Remarks: \_\_\_\_\_

\_\_\_\_\_

**5. Gas Generation Records**

☐ Readily available ☒ Up to date ☐ N/A

Remarks \_\_\_\_\_

\_\_\_\_\_

**6. Settlement Monument Records**

☐ Readily available ☐ Up to date ☒ N/A

Remarks \_\_\_\_\_

\_\_\_\_\_

**7. Groundwater Monitoring Records**

☒ Readily available ☒ Up to date ☐ N/A

Remarks: \_\_\_\_\_

**8. Leachate Extraction Records**

☐ Readily available ☐ Up to date ☒ N/A

Remarks: \_\_\_\_\_

**9. Discharge Compliance Records**

☐ Air ☐ Readily available ☐ Up to date ☒ N/A  
☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

Remarks: \_\_\_\_\_

**IV. O&M COSTS**

**1. O&M Organization**

☐ State in-house ☐ Contractor for State  
☐ PRP in-house ☒ Contractor for PRP  
☐ Other \_\_\_\_\_

**2. O&M Cost Records**

☒ Readily available ☒ Up to date  
☐ Funding mechanism/agreement in place  
☒ Original O&M cost estimate: \$24,900 per year

Total annual costs provided for 1999 through 2003. ☒ Breakdown provided in Five-Year Review Report.

**3. Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: None noted by Site Manager.

**V. ACCESS AND INSTITUTIONAL CONTROLS**

**A. Fencing**

**1. Fencing damaged** ☐ Location shown on map ☒ Gates secured ☒ N/A

Remarks: Outer Perimeter fence is cut in several locations. The O&M site manager states that this is an ongoing problem.

## B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on map ☐ N/A  
 Remarks: Signs exist on inner perimeter fence and warnings are posted on outer perimeter fence. Some sign damage was observed and needs replacing. FDEP phone number needs updating on the inner perimeter fence.

## C. Institutional Controls (ICS)

### 1. Implementation and enforcement

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A  
 Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by) Site inspections and security monitoring

Frequency: Semi-annual monitoring by contractor.

Responsible party/agency: Reichhold Chemical

Contact	<u>Scott Miller</u>	<u>Clean Sites Environmental Services</u>	<u>(832) 379-6452</u>
	Name	Title	Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A  
 Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents are met ☒ Yes ☐ No ☐ N/A  
 Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A  
 Remarks: \_\_\_\_\_

## D. General

1. **Vandalism/trespassing** ☐ Location shown on-site map ☐ No vandalism evident  
 Remarks: Trespassers have cut several holes in the outer perimeter fence.

2. **Land use changes on-site** ☒ N/A  
 Remarks: \_\_\_\_\_

**3. Land use changes off-site** ☐ N/A

Remarks: The property to the east of the Site, which was previously forested, has recently undergone development into single family housing.

## VI. GENERAL SITE CONDITIONS

**A. Roads** ☒ Applicable ☐ N/A

**1. Roads damaged** ☐ Location shown on-site map ☒ Roads adequate ☐ N/A

Remarks: Driveway leading to site in good condition.

**B. Other Site Conditions** ☐ Applicable ☒ N/A

Remarks \_\_\_\_\_

## VII. SOIL COVERS/RCRA Cap ☒ Applicable ☐ Not Applicable

**A. Cap Surface** ☒ Applicable ☐ Not Applicable

**1. Settlement (Low spots)** ☐ Location shown on-site map ☒ Settlement not evident

Areal extent \_\_\_\_\_ Depth \_\_\_\_\_

Remarks \_\_\_\_\_

**2. Cracks** ☐ Location shown on-site map ☒ Cracking not evident

Areal extent \_\_\_\_\_ Widths \_\_\_\_\_ Depths \_\_\_\_\_

Remarks \_\_\_\_\_

**3. Erosion** ☐ Location shown on-site map ☒ Erosion not evident

Areal extent \_\_\_\_\_ Depth \_\_\_\_\_

Remarks \_\_\_\_\_

**4. Holes** ☐ Location shown on-site map ☒ Holes not evident

Areal extent \_\_\_\_\_ Depth \_\_\_\_\_

Remarks \_\_\_\_\_

**5. Vegetative Cover** ☒ Grass ☐ Cover properly established ☐ No signs of stress

Remarks: Vegetative cover consists predominantly of weeds possibly due to inadequate or improper application of seed and fertilize on the cover.

<b>6. Alternative Cover</b> (armored rock, concrete, etc.) <span style="float: right;"><input checked="" type="checkbox"/> N/A</span> Remarks _____
<b>7. Bulges</b> <span style="margin-left: 20px;"><input type="checkbox"/> Location shown on-site map</span> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> Bulges not evident</span> Areal extent _____ Height _____ Remarks _____
<b>8. Wet Areas/Water Damage</b> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> Wet areas/water damage not evident</span> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> Wet Areas  <input type="checkbox"/> Ponding  <input type="checkbox"/> Seeps  <input type="checkbox"/> Soft subgrade                         </div> <div style="width: 45%;"> <input type="checkbox"/> Location shown on-site map Areal extent _____  <input type="checkbox"/> Location shown on-site map Areal extent _____  <input type="checkbox"/> Location shown on-site map Areal extent _____  <input type="checkbox"/> Location shown on-site map Areal extent _____                         </div> </div> Remarks _____
<b>9. Slope Instability</b> <span style="margin-left: 20px;"><input type="checkbox"/> Slides</span> <span style="margin-left: 20px;"><input type="checkbox"/> Location shown on-site map</span> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> No evidence of slope instability</span> Areal extent _____
<b>B. Benches</b> <span style="margin-left: 100px;"><input type="checkbox"/> Applicable</span> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> Not Applicable</span>
<b>C. Letdown Channels</b> <span style="margin-left: 50px;"><input checked="" type="checkbox"/> Applicable</span> <span style="margin-left: 20px;"><input type="checkbox"/> Not Applicable</span>
<b>1. Settlement</b> <span style="margin-left: 40px;"><input type="checkbox"/> Location shown on-site map</span> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> No evidence of settlement</span> Areal extent _____ Depth _____ Remarks _____
<b>2. Material Degradation</b> <span style="margin-left: 20px;"><input type="checkbox"/> Location shown on-site map</span> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> No evidence of degradation</span> Material type _____ Areal extent _____ Remarks _____
<b>3. Erosion</b> <span style="margin-left: 40px;"><input type="checkbox"/> Location shown on-site map</span> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> No evidence of erosion</span> Areal extent _____ Depth _____ Remarks _____
<b>4. Undercutting</b> <span style="margin-left: 40px;"><input type="checkbox"/> Location shown on-site map</span> <span style="margin-left: 20px;"><input checked="" type="checkbox"/> No evidence of undercutting</span> Areal extent _____ Depth _____

Remarks _____
<b>5. Obstructions</b> Type _____ <input checked="" type="checkbox"/> No obstructions <input type="checkbox"/> Location shown on-site map    Areal extent _____ Size _____ Remarks _____
<b>6. Excessive Vegetative Growth</b> Type: <u>Trees</u> <input type="checkbox"/> No evidence of excessive growth <input type="checkbox"/> Vegetation in channels does not obstruct flow <input type="checkbox"/> Location shown on-site map    Areal extent _____ Remarks: <u>There are areas of excessive growth in drainage channels. See photographs 3, 8 and 12.</u>
<b>D. Cover Penetrations</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable
<b>E. Gas Collection and Treatment</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> Not Applicable
<b>F. Cover Drainage Layer</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> Not Applicable
<b>1. Outlet Pipes Inspected</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> Not Applicable Remarks _____
<b>2. Outlet Rock Inspected</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> Not Applicable Remarks _____
<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable
<b>1. Siltation</b> Areal extent _____    Depth _____ <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Siltation not evident Remarks _____
<b>2. Erosion</b> Areal extent _____    Depth _____ <input checked="" type="checkbox"/> Erosion not evident Remarks _____

<b>3. Outlet Works</b> <input checked="" type="checkbox"/> Functioning <input type="checkbox"/> Not Applicable Remarks _____
<b>4. Dam</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> Not Applicable Remarks _____
<b>H. Retaining Walls</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable
<b>I. Perimeter Ditches/Off-Site Discharge</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable
<b>1. Siltation</b> <input type="checkbox"/> Location shown on-site map <input type="checkbox"/> Siltation not evident <input checked="" type="checkbox"/> N/A Remarks _____
<b>2. Vegetative Growth</b> <input type="checkbox"/> Location shown on-site map <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Vegetation does not impede flow Remarks _____
<b>3. Erosion</b> <input type="checkbox"/> Location shown on-site map <input type="checkbox"/> Erosion not evident <input checked="" type="checkbox"/> N/A Remarks _____
<b>4. Discharge Structure</b> <input type="checkbox"/> Functioning <input checked="" type="checkbox"/> N/A Remarks _____
<b>VIII. VERTICAL BARRIER WALLS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable
<b>IX. GROUND WATER/SURFACE WATER REMEDIES</b>
<b>A. Groundwater extraction wells, pumps and pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable
<b>B. Surface water collection structures, pumps and pipelines</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> Not Applicable

<b>1. Collection Structures, Pumps and Electrical</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs O&M Remarks: _____
<b>2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Needs O&M Remarks: _____
<b>3. Spare Parts and Equipment</b>  <input type="checkbox"/> Readily available <input type="checkbox"/> Good Condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided <input checked="" type="checkbox"/> N/A  Remarks: <u>Pipelines are gravity fed; spare parts and equipment not applicable.</u>
<b>C. Treatment System</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable
<b>D. Monitoring Data</b>
<b>1. Monitoring Data</b> <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality
<b>2. Monitoring Data Suggest</b> <input type="checkbox"/> Groundwater plume is effectively contained <input type="checkbox"/> Contaminant concentrations are declining
<b>E. Monitored Natural Attenuation</b>
<b>1. Monitoring Wells (natural attenuation remedy)</b> <input type="checkbox"/> N/A <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs O&M Remarks: _____
<b>X. OTHER REMEDIES</b>  <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> Not Applicable

## **XI. OVERALL OBSERVATIONS**

### **A. Implementation of the Remedy**

The remedial action for the Pioneer Sand Company site in Pensacola, Florida addressed soil, sludge material and groundwater as Operable Unit 1 (OU-1). The remedy consisted of removal of about 20 tons of soils contaminated with PCBs, stabilization of sludge materials under a cap, construction of a leachate collection system and a methane gas collection and venting system along with a long term groundwater monitoring program. Institutional controls to control use of the property have also been pursued.

In essence, the remedy as it stands today is a containment remedy designed to prevent infiltration of rain water reaching waste material; thereby preventing or minimizing leachate production. The remedy appears to have been implemented properly and to be functioning as expected.

### **B. Adequacy of O&M**

The site inspection revealed that some O&M activities need to be improved in accordance with the ROD and O&M Plan. However, none of these areas in need of improvement have adversely affected protectiveness.

### **C. Early Indicators of Potential Remedy Problems**

No early indicators of potential remedy problems were identified during this five-year review.

### **D. Opportunities for Optimization in monitoring tasks or the remedy**

Monitoring: Re-develop the wells to help minimize metals detection.  
Sample wells using low flow sampling techniques.

Remedy: None

**ATTACHMENT 3**  
**SITE PHOTOGRAPHS**



Photograph 1. View looking north across landfill cap taken about 40 feet of west fence. Note 4-inch gas riser pipes along inside of fence. May 20, 2004



Photograph 2. View looking south from about 75 feet south of the perimeter fence. May 20, 2004



Photograph 3. View looking northeast across cap taken about 40 feet of west fence. Note vegetation growing in the rip rap flume in center of photo. May 20, 2004



Photograph 4. East-northeast view across landfill cap looking across location of leachate collection trench. Manhole can be seen in foreground and two of six risers are visible in the distance on the right side of photo. May 20, 2004



Photograph 5. View of 4-inch gas vent pipe that is missing cap. Located on eastern most end of the north line of gas vent pipes. May 20, 2004



Photograph 6. View looking east from cap toward pond. Monitoring well MW-18 is located in middle left of photo behind small wooden structure beside fence. May 20, 2004



Photograph 7. View of monitoring well MW-4A. Protective cover is coated with heavy rust. May 20, 2004



Photograph 8. View looking up flume across landfill cap that is overgrown with vegetation. May 20, 2004



Photograph 9. View looking southwest from downslope edge of landfill cap shows close-up view of growth on cap that consists predominantly of weeds. May 20, 2004



Photograph 10. View of monitoring well MW-2A. Hinge for cap on the well protective casing has been damaged by earthmoving equipment moving dirt at subdivision development. Protective casing has a heavy rust coating. May 20, 2004



Photograph 11. North view across the landfill cap of vegetative cover. May 20, 2004



Photograph 12. Southeast view across landfill cover. Note turf consist consists predominantly of weeds with patchy grass. May 20, 2004



Photograph 13. Southeast view across landfill cover. Note turf consist consists predominantly of weeds with patchy grass. May 20, 2004



Photograph 14. View looking north along west side of perimeter fence. Monitoring well MW-7A can be seen in the foreground on the left. May 20, 2004



Photograph 15. Southeast view from toe of landfill just beyond the leachate collection trench. Monitoring well MW-17 is located in the foreground. Note well's proximity to pond's edge. Plastic 55-gallon drum is located in the wooden structure beside MW-17. Purge water from sampling MW-17 is poured in to the plastic drum.



Photograph 16. View of monitoring well MW-6A located on southwest corner of the Site. Protective well casing has rusted through at base. May 20, 2004



Photograph 17. View of perimeter fence on east side that has been cut by trespassers. May 20, 2004



Photograph 18. View looking south from the perimeter fence on north side shows pond water level on September 17, 2004, one day after Hurricane Ivan visited. The water has receded about a foot.



Photograph 19. View looking west from the east side of the perimeter fence shows pond water level on September 17, 2004, one day after Hurricane Ivan visited. The water has receded about a foot but is still within the landfill cap area and has flooded wells MW-17 and MW-18.

**ATTACHMENT 4**  
**INTERVIEW RECORDS**

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Pioneer Sand Company		<b>EPA ID No.:</b> FLD056116965
<b>Subject:</b> Five-Year Review		<b>Time:</b> 6:25 PM
<b>Date:</b> 07/28/04		
<b>Type:</b> <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b>		
<b>Contact Made By:</b>		
<b>Name:</b> Juan Payne	<b>Title:</b> Geologist	<b>Organization:</b> USACE
<b>Individual Contacted:</b>		
<b>Name:</b> Mr. William Autry	<b>Title:</b> Landowner	<b>Organization:</b> Neighbor
<b>Telephone No:</b> (850) 455-8601	<b>Street Address:</b> 5840 Saufley Pines Road	
<b>Fax No:</b>	<b>City, State, Zip:</b> Pensacola, FL 32526-3783	
<b>E-Mail Address:</b>		
<b>Summary Of Conversation</b>		
<p>When asked his overall impression of the project, Mr. Autry responded that he "basically (was) not too happy to be honest." So much of his land is fenced off that he can't touch it and erosion has become a problem. A defective culvert pipe has partly caused the loss of two feet of ground within the last couple years.</p> <p>When asked about the effects on the community he indicated that he feels the property values have gone down. He also indicated that he felt deceived by the previous property owner who didn't tell him about the site. He indicated that just last week he found out it was a Superfund site. (Mr. Autry and his family purchased the land from Mr. Isaac Nall and have been living at this residence since March 2000.)</p> <p>When asked if he felt well informed about the Site he said that he does not feel too informed about the Site. He expressed concern over the subdivision on the east side of the Site.</p> <p>When asked if he was aware of any activities such as vandalism or trespassing at the site, he indicated that people fishing used to be a problem but he hasn't seen anyone back there fishing in a couple years.</p> <p>When asked if he had any other comments, suggestions, or recommendations regarding the site, Mr. Autry indicated that his primary concern was the erosion on his land on the other side of the fence. Yet he feels that the remedial measures are protecting everyone.</p>		

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Pioneer Sand Company		<b>EPA ID No.:</b> FLD056116965
<b>Subject:</b> Five-Year Review		<b>Time:</b> 10:00AM <b>Date:</b> 07/29/04
<b>Type:</b> <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other		<input checked="" type="checkbox"/> Incoming <input type="checkbox"/> Outgoing
<b>Location of Visit:</b>		
<b>Contact Made By:</b>		
<b>Name:</b> Juan Payne	<b>Title:</b> Geologist	<b>Organization:</b> USACE
<b>Individual Contacted:</b>		
<b>Name:</b> Mrs. Marla Wood	<b>Title:</b> Landowner	<b>Organization:</b> Neighbor
<b>Telephone No:</b> (850) 453-0517	<b>Street Address:</b> 5860 Saufley Pines Road	
<b>Fax No:</b>	<b>City, State, Zip:</b> Pensacola, FL 32526-3783	
<b>E-Mail Address:</b>		
<b>Summary of Conversation</b>		
<p>When asked his overall impression of the project, Mrs. Wood said that she really doesn't have an impression. Everything is fine but she is ready to sell their land and move back to Virginia. (The Wood's family has been living at this address since August 2002.)</p> <p>When asked what effects the site operation has on the surrounding community, she feels strongly that the pond is a breeding ground for mosquitoes and she has become deeply concerned over this with the dangers of the West Nile virus carried by mosquitoes. This past summer she would not let her 2-year old granddaughter go outside because there were so many mosquitoes.</p> <p>When asked if she had any comments, suggestions, or recommendations regarding the site, She indicated that when they were shown the property the real estate agent told them that the site was cleaned up and they would be removing the fence shortly. This is the same information she has told the people that she has shown her home to recently.</p>		

## INTERVIEW RECORD

<b>Site Name:</b> Pioneer Sand Company		<b>EPA ID No.:</b> FLD056116965	
<b>Subject:</b> Five-Year Review		<b>Time:</b> 12:30PM	<b>Date:</b> 05/20/04
<b>Type:</b> <input type="checkbox"/> Telephone <input checked="" type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input type="checkbox"/> Outgoing	
<b>Location of Visit:</b>			
<b>Contact Made By:</b>			
<b>Name:</b> Juan Payne		<b>Title:</b> Geologist	<b>Organization:</b> USACE
<b>Individual Contacted:</b>			
<b>Name:</b> Mr. Scott Miller		<b>Title:</b> Site Manager	<b>Organization:</b> CSES
<b>Telephone No:</b> (703) 519-2140		<b>Street Address:</b> 228 South Washington Street,	
<b>Fax No:</b> (703) 519-2141		Suite 115	
<b>E-Mail Address:</b> SMiller165@aol.com		<b>City, State, Zip:</b> Alexandria, VA 22314	
<b>Summary of Conversation</b>			
<p>When asked what his impression of the site, Mr. Miller responded that the Site is in good shape. The vegetative cover is doing well and there have been no signs that the cap is settling. In addition, the groundwater quality data continues to be favorable at the Site.</p> <p>When questioned if the remedy was functioning as expected, Mr. Miller replied, "yes". It is performing very good based on groundwater quality data.</p> <p>When asked what the monitoring data showed he responded that it shows that the remedy is working. We have had some elevated concentrations of total metals (chromium) detected during some sampling events. However, the results were similar to those found in the up-gradient well. Are there any trends that show the contaminant levels are decreasing? Contaminant levels have never really been an issue at the Site.</p> <p>When asked if there have been any unexpected O&amp;M difficulties in the last five years, Mr. Miller replied, "no." There was some excessive erosion (prior to the last five year review) outside the "waste area" resulting from a major storm event. However, that was repaired immediately and there have been no problems since then.</p> <p>Have there been opportunities to optimize O&amp;M or sampling efforts? Please describe changes and resultant or desired cost savings or improved efficiency? At the request of EPA, we have started collecting turbidity data during groundwater sampling to provide additional information regarding total metals data. We have seen a direct correlation between elevated turbidity readings and elevated concentrations of total chromium. It is recommended that we start using "low flow" sampling techniques to help reduce the turbidity of the groundwater samples.</p> <p>Mr. Miller was asked if he had any comments suggestions, recommendations regarding the project. He responded that based on the historical data, we think it is appropriate to sample on an annual basis in the short term, and ultimately phase-out the O&amp;M monitoring program prior to 2011.</p>			

<b>INTERVIEW RECORD</b>		
<b>Site Name:</b> Pioneer Sand Company		<b>EPA ID No.:</b> FLD056116965
<b>Subject:</b> Five-Year Review		<b>Time:</b> 2:15 PM <b>Date:</b> 07/29/04
<b>Type:</b> <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Visit <input type="checkbox"/> Other		<input type="checkbox"/> Incoming <input checked="" type="checkbox"/> Outgoing
<b>Location of Visit:</b>		
<b>Contact Made By:</b>		
<b>Name:</b> Juan Payne	<b>Title:</b> Geologist	<b>Organization:</b> USACE
<b>Individual Contacted:</b>		
<b>Name:</b> Mr. Larry Pearson	<b>Title:</b> Landowner	<b>Organization:</b> Neighbor
<b>Telephone No:</b> (850) 982-0842 <b>Fax No:</b> <b>E-Mail Address:</b>		<b>Street Address:</b> 5655 Saufley Pines Road <b>City, State, Zip:</b> Pensacola, FL 32526-3783
<b>Summary of Conversation</b>		
<p>When asked his overall impression of the project, Mr. Pearson responded, "It's fine, I don't see any problem with it. I've owned my property for three years."</p> <p>When asked what effects the site operation has on the surrounding community Mr. Pearson replied, "No affects at all. The biggest thing is that people are scared of it."</p> <p>When asked if he felt well informed about the Site Mr. Pearson replied, "None whatsoever."</p> <p>When asked if he was aware of any activities such as vandalism or trespassing at the site, "I know there are people going back there fishing, that's the only thing they go back there for."</p> <p>When asked if he had any other comments, suggestions, or recommendations regarding the site, he replied, "the only question I have is how long are those wells going to be on my property?"</p>		

**ATTACHMENT 5**

**STATE AND SITE COMMENTS**

October 27, 2004

Mr. Wesley S. Hardegree  
Remedial Project Manager  
United States Environmental Protection Agency  
Region 4  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, GA 30303-8960

**SUBJECT: Pioneer Sand Company – Draft Five Year Review Report**

Dear Wes:

The Florida Department of Environmental Protection has reviewed the September 2004 Draft Second 5 Year Review Report for the Pioneer Sand Company Superfund site in Pensacola, Escambia County, Florida. We submit the following comments for your consideration.

- It was assumed in the ROD that shallow groundwater flow was around the landfill created onsite (the waste-in-place remedy). It is now evident that this was in error. The concern is that contaminants may be migrating down-gradient of the site beyond the present network of monitoring wells. The recommendation to include existing well MW-5A for future site groundwater monitoring should be implemented to determine if significant concentrations of site contaminants are migrating in the down-gradient direction.
- In Table 1, Chronology of Site Events, the event "Site Listed on National Priorities List" has an incorrect date.
- In Table 5, the actual detection limits should be listed, and not just noted as "ND".
- Bottom of page 4, last paragraph, first sentence – the phrase should read "...the Pioneer Sand Pit was used as a borrow area..."
- Bottom of page 6, second to last paragraph, last sentence – the word "absent" should be changed to "absence".

- Top of page 7, first paragraph, sentence beginning “This alternative consisted of...” – the word “installation” should be changed to “installing”.
- Bottom of page 19, last sentence – the word “is” should be deleted.
- Top of page 24 – the acronym for “Remedial Action Objectives” should read (RAO) instead of (RGO)
- The FDEP concurs with the Recommendations and Follow-up Actions presented in the report. They appear to be adequate for ensuring that the remedy remains protective of human health and the environment.

For any questions or if you would like to discuss these comments further, please contact me at (850) 245-8927.

Sincerely,

Theresa C. Pepe  
Project Manager  
Hazardous Waste Cleanup Section



## CLEAN SITES®

Wesley S. Hardegree  
Remedial Project Manager  
U.S. Environmental Protection Agency  
Region IV  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, Georgia 30303

November 5, 2004

Subject: **Comments – Second Five-Year Review Report  
Pioneer Sand Company Site  
Pensacola, Florida**

Dear Mr. Hardegree:

We have reviewed the draft Second Five-Year Report for the Pioneer Sand Company Site. As discussed last week, we offer the following comments:

1. It should be noted that this five-year review report is an EPA policy review and not a statutory requirement. The pre-SARA remedial action was not selected pursuant to CERCLA Section 121.
2. Section I should acknowledge that the US Navy is funding 50% of the remedy.
3. An Amended Conservation Easement was granted by Walter and Celia Dugger to the United States of American recorded July 23, 1992. Our records indicated that the original of the Amended Conservation Easement was transmitted to Mary Ardoff, Esq. (Region IV's Office of Regional Counsel) on August 6, 1992. We would be happy to provide you with a copy.
4. Section VI contains an extensive discussion comparing concentrations of total chromium and cadmium detected in the monitoring wells with their respective MCLs and corresponding upgradient monitoring Well MW-1A concentrations. A discussion of dissolved metals data should also be provided. Dissolved chromium and cadmium are generally not detected in the monitoring wells and I don't believe they have ever been detected at concentrations higher than their corresponding MCL. Sediment (high turbidity) in a groundwater sample can have a significant impact (increase) on the detected concentrations (total metals); however it is likely not transported through an aquifer. Therefore, concentrations of dissolved metals should be considered when evaluating off-site migration. The actual MCL for chromium is based on the total concentration of the trivalent and hexavalent forms of dissolved chromium (Cr<sup>3+</sup> and Cr<sup>6+</sup>) (see <http://www.epa.gov/safewater/dwh/t-ioc/chromium.html>). Starting with the October 2004 sampling event, we began using the "low flow" sampling protocol to help lower the turbidity in the groundwater samples and provide more representative data.

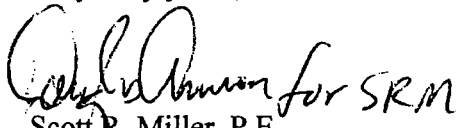
**Clean Sites Environmental Services, Inc.**  
228 South Washington Street Suite B30  
Alexandria, Virginia 22314  
703.519.2140  
703.519.2141 (fax)

5. Table 3 in Section IV summarizes the O&M costs from 1999-2003. The report suggests that there has been an appreciable "savings" since reseeding and fertilizing was discontinued. There has been some cost reductions realized; however, the biggest cost reduction resulted from the recommendation of the First Five-Year Review Report which recommended mowing the Site less frequently. The Site was originally being mowed approximately 16 times per year (twice every 45 days). We reduced the mowing frequency to approximately 4 times per year, although some extra mowing events have been added during unusually wet seasons. In addition, the unit cost per mowing has also been decreased. Further, the 1999 cost of \$74,660 shown on Table 3 included a \$20,000 EPA oversight bill and costs for repairing the drainage swale that failed during a hurricane that year. It should also be noted that the cost for 2000 should be \$21,501 not \$40,952 as shown on Table 3. We believe that O&M should continue to be conducted in a cost-effective manner.
6. Since the vegetative cover is well established with minimal bare areas and excessive fertilizer may be detrimental to groundwater and surface water, the frequency of fertilizing and reseeding was reduced to an "as-needed" basis. The local landscaper has been concerned that we could possibly burn up the vegetation if there was not sufficient precipitation after applying the fertilizer. In addition, he felt that reseeding would have little impact without adequate irrigation and may disrupt its current state of equilibrium by forcing changes in plant species type and diversity. The vegetative cover is performing as designed; there was no erosion at the Site after Hurricane Ivan passed through Pensacola this year dumping massive amounts of rain on the area. However, should a problem arise with the vegetation in the future, we will make the necessary repairs.
7. Section IX, Item 2a, Part ii recommends incorporating Well MW-5A to the monitoring program. We propose incorporating Well MW-5A into the program and deleting and abandoning Well MW-2A. As you know, Well MW-2A is located outside the fenced area in the middle of where a new residential subdivision is being built. In addition, Well MW-2A is not downgradient of the waste and consistently has a water level approximately 2 feet higher than in Wells MW-17 and MW-18 (closest down-gradient wells). It should be noted that Well MW-5A was sampled during the October 2004 event.
8. Section IX, Item 2a, Part iii recommends updating the O&M Plan to acknowledge a conceptual model outlined in Section VII of the Second Five-Year Review Report. Since the Second Five-Year Review Report will be in the administration record, we do not see a purpose for updating the O&M Plan. A conceptual model is not part of the scope of the O&M Plan.

9. Section IX, Item 2a, Part iv recommends addressing the status of the outer perimeter fence. I have discussed this matter with Mr. Cotton (near Well MW-6A) and Mr. Autry (near Well MW-4A) and while we are not responsible for maintaining the outer perimeter fence, they would prefer that the fence remain in place. However, they would like us to remove the "dog eared" portions of the fence to improve access to their properties. Therefore, we propose removing only the "dog eared" portions of the fence. The O&M Plan does not specifically address the perimeter fence so no change to the Plan is necessary.
10. Section IX, Item 2d, Part I recommends painting the monitoring wells. As we discussed last week, there are concerns about painting the protective covers. This concern is raised, for example, by the Corps of Engineers Manual EM 1110-1-4000, Engineering and Design - Monitoring Well Design, Installation, and Documentation at Hazardous Toxic, and Radioactive Waste Sites that states: "All painting of the protective casing must be done offsite, prior to installation."

Should you have any questions regarding these comments, please call me at (703) 519-2142.

Very truly yours,

  
Scott R. Miller, P.E.  
Project Manager

**ATTACHMENT 6**

**EPA RESPONSE TO COMMENTS**

**EPA RESPONSE TO COMMENTS FROM STATE**  
**(NOTE: EPA responses are included in *italics*)**

***October 27, 2004***

Mr. Wesley S. Hardegree  
Remedial Project Manager  
United States Environmental Protection Agency  
Region 4  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, GA 30303-8960

**SUBJECT: Pioneer Sand Company – Draft Five Year Review Report**

Dear Wes:

The Florida Department of Environmental Protection has reviewed the September 2004 Draft Second 5 Year Review Report for the Pioneer Sand Company Superfund site in Pensacola, Escambia County, Florida. We submit the following comments for your consideration.

- It was assumed in the ROD that shallow groundwater flow was around the landfill created onsite (the waste-in-place remedy). It is now evident that this was in error. The concern is that contaminants may be migrating down-gradient of the site beyond the present network of monitoring wells. The recommendation to include existing well MW-5A for future site groundwater monitoring should be implemented to determine if significant concentrations of site contaminants are migrating in the down-gradient direction.

*Agreed. In fact, Recommendation 2.a.ii adds MW-5A to the monitoring system.*

- In Table 1, Chronology of Site Events, the event “Site Listed on National Priorities List” has an incorrect date.

*The date has been changed to 1983.*

- In Table 5, the actual detection limits should be listed, and not just noted as “ND”.

*The table has been is updated.*

- Bottom of page 4, last paragraph, first sentence – the phrase should read “...the Pioneer Sand Pit was used as a borrow area...”  
*The correction has been made.*
- Bottom of page 6, second to last paragraph, last sentence – the word “absent” should be changed to “absence”.  
*The correction has been made.*
- Top of page 7, first paragraph, sentence beginning “This alternative consisted of...” – the word “installation” should be changed to “installing”.  
*The correction has been made.*
- Bottom of page 19, last sentence – the word “is” should be deleted.  
*The correction has been made.*
- Top of page 24 – the acronym for “Remedial Action Objectives” should read (RAO) instead of (RGO)  
*The correction has been made.*
- The FDEP concurs with the Recommendations and Follow-up Actions presented in the report. They appear to be adequate for ensuring that the remedy remains protective of human health and the environment.

For any questions or if you would like to discuss these comments further, please contact me at (850) 245-8927.

Sincerely,

**Theresa C. Pepe**  
Project Manager  
Hazardous Waste Cleanup Section

## **EPA RESPONSE TO COMMENTS FROM CSES**

1. Agreed. The clarification was made to the report (see summary form).
2. Agreed. The update was made to the report (see page 2).
3. Agreed. The update was made to the report (see page 8).
4. A statement on dissolved phase chromium and cadmium was added to the report (see page 16).
5. A statement covering reseeding and fertilizing was added to the report (see page 12). The O&M cost for 2000 was found to be correct; no report revision made.
6. The recommendation was revised to address the comment (see page 27).
7. The recommendation was added to remove MW-2A from the monitoring system (see page 26).
8. Agreed. The report was updated to remove the reference to a conceptual model in the O&M Plan.
9. The report was not changed in response to this comment. The recommendation just asks for the O&M Plan to provide a status of the fence.
10. The recommendation was revised to address this comment (see page 27).